KHALATNIKOV, I.M.

AUTHORS:

Abrikosov, A. A., Khalatnikov, I. M.

56-1-28/56

TITLE:

The Scattering of Light in a Fermi Fluid (Rasseyaniye sveta v Fermi-zhidkosti)

PERIODICAL:

Zhurnal Eksperimental noy i Teoreticheskoy Fiziki, 1958,

Vol. 34, Nr 1, pp. 198-203 (USSR)

ABSTRACT:

The present paper determines the distribution of the scattered light to the angles and to the frequencies. According to Landau (reference 1) oscillations of a certain type which are designated as "zero sound" can spread in a Fermi fluid at sufficiently low temperatures. Even at a temperature of 0,010 a frequency of more than lo8 cycles is needed for the immediate observation of zero sound, which renders the performance of such an experiment very difficult. But an indirect method can also be suggested which consists of the observation of the Rayleigh scattering of light in liquid He?. The observation of the frequency distribution of the scattered light principally makes possible the measurement of the speed of zero sound. Besides, the scattering of the light in a Fermi fluid has a number of specific features, wherefore the theoretical investigation

Card 1/3

The Scattering of Light in a Fermi Fluid

56-1-28/56

of this phenomenon, especially of the distribution of the intensities to the frequencies, is of interest. Due to the very small polarizability of the helium-atoms it may be assumed that the dielectric constant changes due to the fluctuation of density. In the range of those temperatures and frequencies where $t \triangle \omega \geqslant kT$ applies the quantum effects must be taken into account in the averaging of all possible fluctuations. But for this purpose only the knowledge of the purely classical case is needed and then a certain corrective factor has to be introduced. The fluctuation of the "random force" contained in the kinetic equation is determined by the method suggested by Rytov (reference 5). Landau and Lifshits (reference 6). After the solution of this equation the fluctuations of the distribution function can then also be determined. The kinetic equation used here for the case of the Fermi fluid is explicitly written down. The authors are furthermore only interested in the case that the collisions can be disregarded. In this connection the exact form of the shock integral does not have to be known. But the velocity of modification of the entropy has to be determined. The course of the calculation is followed step by step. In this manner formulae for the calculation

Card 2/3

The Scattering of Light in a Fermi Fluid

56-1-28/56

is followed step by step. In this manner formulae for the calculation of the fluctuations of the distribution function are found. Finally the formula found for the distribution of the scattered light to the angles and frequencies is explicitly written down. The frequency spectrum consists of a central part and of two sharp lines. The central part corresponds to the Doppler broadening of the main line. There are 9 references, 7 of which are Slavic.

ASSOCIATION:

Institute for Physical Problems AN USSR

(Institut fizicheskikh problem Akademii nauk SSSR)

SUBMITTED:

July 30, 1957

AVAILABLE:

Library of Congress

Card 3/3

Cará 1/2

AUTY CaC: Abrikosov. A. A., Lorthov. L. P., 500/56-35-1-37/59

TITLE: A Superconductor in a Figh-Frequency Field (Sverkhorovodník v vysokochostotnom pole)

FERIODICAL: Zhurnol eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 35, Nr 1, pp. 265-275 (USSR)

ABSTRACT:

Sardeen, Cooper and Schrieffer (Bardin, Kuper, Shriffer) developed a microscopical theory of superconductivity (Ref 1). In the present paper the question is investigated as to how superconductors behave in variable weak fields, and a new (not local) equation is derived, which describes the connection between current and field instead of the equation of the phenomenological theory by F. and G. London. Also the question of the depth of penetration of a weak static field into massive superconductors and their dependence on temperature is dealt with. In the present paper the authors investigate the behavior of superconductors in high-frequency fields and derive an equation describing this behavior. The paper is subdivided into 4 sections. The first deals with the getting-

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up of an equation for the current in superconductors $\vec{J}(\vec{k},\omega)$

A Superconductor in a High-Frequency Field

307/54-35-1-37/59

in dependence on $\overrightarrow{A}(x)$; section two deals with Fippard's limiting case, and section three deals with London's domain (vk≪∆). In section four the temperature- and frequency dependence of the impedance of a massive superconductor is determined by means of the equation derived as mentioned above. Finally, the authors thank L.'). Landau, Academician, for the interest he displayed in their work. There are 5 references, 1 of which is Soviet.

ASSOCIATION:

Institut fizicheskikh problem Akademii nauk SSSR (Institute of Physical Problems, AS USSR)

SUBMITTED:

March 4, 1958

Card 2/2

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000721710013-9"

CONTROL OF THE CONTRO

AUTHORS:

Abrikosov, A., Khalatnikov, I. M.

SOV/53-65-4-2/13

TITLE:

Modern Theory of Superconductivity (Sovremennaya teoriya

sverkhprovodimosti)

PERIODICAL:

Uspekhi fizicheskikh nauk, 1958, Vol 65, Nr 4,

pp. 551 - 591 (USSR)

ABSTRACT:

In this paper a survey is given on the present state of

the theory of superconductivity; aside from a short

historical review the paper is restricted to later publications.

Landau and Kapitsa were the first ones in the USSR to take up these problems, further N.N.Bogolyubov, V.Tolmachev, D.Shirkov ("New Methods in the Theory of Superconductivity"; lithographed edition of the Ob"yedinennyy institut yadernykh issledovaniy (United Institute of Nuclear Research)), L.

Gor'kov, S. Tyablikov, N. Zavaritskiy, D. Shenberg and B. Geylikman.

The papers by Landau and Bogolyubov are considered in particular. The authors treat in detail: The theory of the

Cooper (Kuper) phenomenon, the ground state of superconductors, (the role of the Coulomb (Kulon) interaction of the electrons),

thermodynamics in superconductors, (the measurement of the energy gap with temperature, the specific heat, the critical

Card 1/2

Modern Theory of Superconductivity

SOV/53-65-4-2/13

magnetic field, the number of the "normal" electrons), furthermore the electrodynamic equations for superconductors (T = 0 and T ≠ 0, the depth of penetration, the diffusion dispersion, the properties of superconductors of finite dimensions), the behavior of superconductors in a periodic (high-frequency) field, (the Pippard critical case, the London domain, the impedance), and in the last section the heat conductivity of superconductors. There are 4 figures and 22 references, 14 of which are Soviet.

Card 2/2

AUTHORS:

Abrikosov, A. A., Khalatnikov, I. M. SOV/53-66-2-3/9

TITLE:

The Theory of the Fermi Liquid (the Properties of Liquid He at Low Temperatures) (Teoriya Fermi-zhidkosti (svoystva

zhidkogo He³ pri nizkikh temperaturakh))

PERIODICAL:

Uspekhi fizicheskikh nauk, 1958, Vol 66, N $_{\mathbf{r}}$ 2, pp 177-212

ABSTRACT:

In 1956 L. D. Landau developed a systematic theory concerning the Fermi liquid (Ref 1). (It was also Landau who carried out the first quantum-theoretical investigation of the superfluidity of He II and who developed a theory of the Bose liquid). He also showed that, in contrast to what is the case in the Bose liquid, the interaction of excitation plays a very important part in the Fermi liquid. In the course of the present article the authors give a survey of the present stage of investigations of the properties of Fermi liquids on the basis of Landau's theory and by assuming the isotropy of the models investigated. Finally, the latest and final works by Landau are discussed (Refs 8, 12, 14, 21) in which it is shown in what way it is possible to

Card 1/3

The Theory of the Fermi Liquid (the Properties of Liquid He³ at Low

derive the basic hypotheses of the theory of the Fermi liquid from a microscopical investigation of the interaction. Also the theory of the dissolved Fermi gas is taken into account. The following individual problems are dealt with in 10 paragraphs: 1) The excitation energy (ansatz for the energy of quasi-particles $\delta L = \int \mathcal{E} \, \delta n \, d\tau \, \text{with } d\tau = 2 dp_{x} dp_{y} dp_{z}/(2\pi h)^{3} \, (\text{Factor 2 takes into account that spin} = 1/2) \, \text{and for the energy } \mathcal{E}:$ $\mathcal{E} = \mathcal{E}_{0}(p, \vec{0}) + \delta \, \mathcal{E}(\vec{p}, \vec{0})).$ 2) The effective mass ($\mathcal{E}_{0} - \mu(0) = v(p-p_{0}) \, v = p_{0}/m^{*}, \text{where } m^{*} \, \text{denotes the effective mass}). 3) Specific heat and entropy (<math>C = (\partial E/\partial T)_{N}; \, C = C/N = \gamma T; \, \gamma = (\pi/3N)^{2/3}... \frac{m^{*}}{h^{2}}; \, \gamma \sim 3 \, \text{cal/mol-degr.}^{2}; \, \varrho = 0.078 \, \text{g/cm}^{3}; \, m^{*} = 1.43 \, m_{He}^{3}; \, \frac{p_{0}}{h} = 0.76.10^{8} \, \text{cm}^{-3}.$ 4) Magnetic susceptibility; 5) The kinetic equation; 6) Viscosity ($\gamma = \alpha/T^{2}; \, \alpha \sim 10^{-6} \, \text{to } 10^{-5} \, \text{Poise},$

Card 2/3

The Theory of the Fermi Liquid (the Properties of Liquid He at Low

T in ${}^{O}K$); 7) Thermal conductivity ($\kappa = \frac{\beta}{T}$; $\beta \sim 10^2$ to 10^3 erg/cm.sec.degr.); 8) Sound (laws of the propagation of sound for $\omega \tau \ll 1$ and $\omega \tau \gg 1$); 9) Dispersion and the absorption of sound; 10) The propagation of light, fluctuations of the distribution function. In an appendix the Paragraph 1 deals with the dissolved Fermi gas and parature α with the microscopical theory of the Fermi liquid graph 2 with the microscopical theory of the Fermi liquid are Soviet.

Card 3/3

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000721710013-9"

24(0) AUTHOR:

Khalatnikov, I. M., Doctor of Physical and Mathematical Sciences

TITLE:

Investigations of Low-temperature Physics (Issledovaniya pofizike nizkikh temperatur)

PERIODICAL:

Vestnik Akademii nauk SSSR, 1959, ANr 2, pp 98-100 (USSR)

ABSTRACT:

The 5th All-Union Conference on this problem took place in Tbilisi from October 27 to November 1, 1958. It was attended by physicists from Moscow, Khar'kov, Leningrad, Tbilisi, Sverdlovsk, and Kiyev. 4 fields of low-temperature physics were discussed: superinquidity of liquid helium II, supraconductivity, antiferromagnetism, magneto-resistive effect. The following reports and communications were heard: A. A. Abrikosov, L. P. Gor'kov reported on the investigation of the properties of supraconductive alloys. A. A. Abrikosov, L. P. Gor'kov, I. M. Khalatnikov spoke of properties of supraconductors in the high-requency magnetic field. D. V. Shirkov and Chen' Chun'-yan' Moscow University, described investigations for determination of the influence exercised by the Coulomb (Kulon) interaction of charges on supraconductivity. V. V. Tolmachev explained the

Card 1/4

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Investigations of Low-temperature Physics

SOV/30-59-2-42/60

nature of the so-called collective excitations of the Bose type in supraconductors. D. N. Zubarev, Yu. A. Tserkovnikov spoke of the thermodynamics of supraconductors and B. T. Geylikman, V. Z. Kresin of the thermal conduction of supraconductors. Yu. V. Sharvin, V. F. Gantmakher reported on experimental work with supraconductors. N. V. Zavaritskiy spoke of the measurement of the anisotropy of thermal conductivity in the supraconductive state. In a series of reports problems of the superliquidity of helium were discussed, which was discovered in 1938 by P. L. Kapitsa and the theory of which was set up in 1941 by L. D. Landau. E. L. Andronikashvili and his collaborators investigated the properties of retating helium. V. P. Peshkov spoke of the effect of the formation of the boundary between superliquid and non superliquid helium. Guan Vey-yan', collaborator of the Institut fizicheskikh problem (Institute of Physical Problems) investigated the properties of the so-called jump in temperature of Kapitsa. I. M. Lifshits, V. D. Peschanskiy investigated galvanomagnetic phenomena in strong magnetic fields for metals with open Fermi surfaces. N. Ye. Alekseyevskiy, Yu. P. Gajdukov experimentally investigated the resistance anisotropy of gold monocrystals in the

Card 2/4

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Investigations of Low-temperature Physics

SOV/30-59-2-42/60

magnetic field. L. S. Kan, B. G. Lazarev combine the presence of a temperature minimum with the structural state of the metal. M. Ya. Azbel' reported on the quantum theory of metallic conductivity in the alternating electromagnetic and constant magnetic field. A. S. Borovik-Romanov reported on the weak ferromagnetism in antiferromagnetic samples of MnCO₃. N. M. Kreynes, Ye. A. Turov investigated the magnetic anisotropy of the antiferromagnetic monocrystals CuSO₄ and CoSO₄. R. A. Alikhanov reported on neutronographic description.

reported on neutronographic investigations of antiferromagnetics. Ye. I. Kondorskiy and collaborators reported on the susceptibility of nickel and nickel-copper alloys at low temperatures. M. I. Kaganov, V. M. Tsukernik reported on kinetic phenomena in ferromagnetics at low temperatures. A. I. Akhiyezer, V. G. Bar'yakhtar, and S. P. Peletminskiy spoke of computations of the relaxation of the magnetic moment in ferromagnetic dielectrics at low temperatures. T. I. Sanadze spoke of observation results of paramagnetic resonance of terbium in the TbNO₃. 6H₂O nitrate. G. R. Khutsishvili gave a theoretical analysis of the orientation of the nuclear spin in the Overhauser (Overkhauzer)

Card 3/4

24(5),24(8)

AUTHOR:

Khalatnikov, I. M.

sov/56-36-6-27/66

TITLE:

The Influence of Anisotropy Superconductors (Vliyaniye anizotropii na teploprovodnost' on the Thermal Conductivity of

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 6, pp 1818-1822 (USSR)

ABSTRACT:

The electron part of the thermal conductivity of superconductors according to the theory of Bardeen, Cooper, and Schrieffer has already been investigated by several authors, but only on the assumption that the superconductor is isotropic. The author of the present paper carries out quite the same calculations, but on the assumption of anisotropy. Bogolyubov, Tolmachev, and Shirkov (Ref 4) already calculated the energy spectrum of anisotropic superconductors and showed that the same method may be employed as in the isotropic case. Either Fröhlich's or Bardeen's Hamiltonian servæ as a basis. The author of the present paper uses the Hamiltonian:

Card 1/2

 $H = \sum_{k} (E_{k}^{-\mu}) a_{k}^{+} a_{k}^{+} + \frac{1}{2} \sum_{k} g(\vec{k}_{1}^{\prime}, \vec{k}_{2}^{\prime}; \vec{k}_{1}^{\prime}, \vec{k}_{2}^{\prime}) a_{k_{1}^{\prime}}^{+} 1/2^{a_{k_{2}^{\prime}} - 1/2} a_{k_{1}^{\prime}} 1/2^{a_{k_{2}^{\prime}} - 1/2}$

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The Influence of Anisotropy on the Thermal Conductivity of Superconductors

SOV/56-36-6-27/66

(µis the chemical potential). It is shown that for uniaxial crystals the temperature dependence of the thermal conductivity may differ according to the various directions of the crystallographic axes. N. V. Zavaritskiy (Ref 5) already showed this for gallium in the superconductive state. The author finally thanks L. D. Landau for discussing the results of this investigation. There are 1 figure and 5 references, 3 of which are Soviet.

ASSOCIATION:

Institut fizicheskikh problem Akademii nauk SSSR (Institute for Physical Problems of the Academy of Sciences, USSR)

SUBMITTED:

December 18, 1958

Card 2/2

24 (3)

AUTHORS -

Abrikosov, A. A., Gor'kov, L. P.,

807/56-37-1-29/64

Khalatnikov, I. M.

TITLE:

The Analysis of Experimental Data on the Surface Impedance of Superconductors (Analiz eksperimental nykh dannykh o poverkhnostnom impedanse sverkhprovodnikov)

PERIODICAL:

Zhurnal eksperimental noy i teoreticheskoy fiziki, 1959, Vol 37,

ABSTRACT:

The authors compare the experimental data on the measurement of the surface impedance of superconductors for different frequencies with the conclusions drawn from the new theory of superconductivity. The properties of superconductors in a high-frequency field were investigated in a previous paper of the authors (Ref 1) and in a paper by D. C. Mattis and J. Bardeen (Ref 2). The present paper compares the theory with the experimental data on the surface impedance of superconductors. The authors give, above all, formulas for the surface impedance in various limiting cases which are suitable for a convenient comparison with the experiment. The amount usually measured by experiment, of the ratio between the impedance $Z(\omega)$ in supercon-

Card 1/3

The Analysis of Experimental Data on the Surface SOV/56-37-1-29/64

ductive state and the real part of the impedance in the normal state is given by the formula $Z(\omega)/R_n = -2i(\pi\omega/\Delta Q(\omega))^{1/2}$ in Pippard's limiting case. An expression for the complex function $Q(\omega)$ is then written down, and an expression for the frequency dependence of the impedance follows subsequently. Now the authors analyze the temperature dependence for various frequencies at temperatures different from zero. The following cases are investigated in detail (the quantity 2 denoting the gap, in the energy spectrum at a given temperature): (a) $\omega \ll \Delta(0)$, (b) ω~Δ(0): This very case is the most difficult one for comparing theory with experiment, for the quantities Δ , ω and T are, over a large part of the temperature interval 0<T<Tc, of the same order of magnitude. The expression for $Q(\omega)$ can only be simplified in the range of low temperatures T&W. (c) $\omega\gg\Delta$ (0). In this case, only the ratio between T and Δ changes, and ω is always large with respect to these two quantities. The formulas written down in the present paper permit a detailed comparison of theory with numerous experimental data.

Card 2/3

The Analysis of Experimental Data on the Surface Impedance of Superconductors

SOV/56-37-1-29/64

In the range of very high frequencies $\omega\gg$, no experimental data have become known up to date. The causes of disagreement between the experimental data and the values of impedance calculated by the new theory of superconductivity have not yet been clarified. There are 3 figures and 6 references, 3 of

ASSOCIATION:

Institut fizicheskikh problem Akademii nauk SSSR (Institute of Physical Problems of the Academy of Sciences, USSR)

SUBMITTED:

February 3, 1959

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S/030/60/000/011/005/026 B021/B059

AUTHOR:

Khalatnikov, I. M., Professor

TITLE:

Problems in Low-temperature Physics 2

PERIODICAL:

Vestnik Akademii nauk SSSR, 1960, No. 11, pp. 28-35

TEXT: Low-temperature physics includes a large number of phenomena of which superfluidity, superconductivity, antiferromagnetism, and galvanomagnetic phenomena in metals are particularly emphasized. Superfluidity in helium was discovered by P. L. Kapitsa in 1938. Temperature dependence of the thermodynamic quantities of helium were explained by L. D. Landau by the existence of a minimum in the energy spectrum. Fluid helium, consisting of He4 isotopic atoms and obeying Bose statistics, exhibits the property of superfluidity. At present, research of the properties of liquid helium is concentrated to the properties of the liquid He3 isotope. This field is regarded presently as the most promising area of research. The phenomenon of superconductivity had been discovered by Kamerlingh-Onnes 50 years ago, but has been explained only in the last few years. Superconductivity of metals is distinguished not only by vanishing resistivity, but also by extraordinary magnetic properties. The energy spectrum of superconductive Card 1/2

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Problems in Low-temperature Physics

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metals has, among others, also been explained by the Soviet scientist N. N. Bogolyubov on the basis of a system of Fermi electrons. The young scientist L. P. Gor'kov, who investigated the excitation spectrum by means of field quantum theoretical methods is also mentioned. Galvanomagnetic properties of metals have been investigated during the last years at the Institut fizicheskikh Problem Akademii nauk SSSR (Institute for Physical institut Akademii nauk USSR) and at the Fiziko-tekhnicheskiy Academy of Sciences UkrSSR). The dependence of Physics and Technology of the tivity and other electrical characteristics of metals on magnitude and purpose of explaining the electron spectrum. The energy spectrum of the excitation of antiferromagnetics has not been obtained so far. Achieve-physicists. There is I figure.

Card 2/2

KHALATNIKOV, I. M.

S/056/60/039/01/19/029 B006/B063

AUTHORS:

Lifshits, Ye. M., Khalatnikov, I. M.

TITLE:

On the Singularities of Cosmological Solutions of the

Gravitational Equations.

PERIODICAL:

Zhurnal eksperimental noy i teoreticheskoy fiziki,

1960, Vol. 39, No. 1(7), pp. 149-157

TEXT: The usualloy applied cosmological solution of the Einstein gravitational equation is based on the assumption of an entirely homogeneous and isotropic mass distribution in space though this assumption is at most approximately satisfied. In the present paper, the authors wanted to clarify as to how far the properties of the solution and, above all, the occurrence of time singularities are connected with this assumption. This problem can be tackled most successfully by studying the general properties of the solutions to gravitational equations in the neighborhood of singularities. The existence of such solutions is assumed. Two particular classes of these solutions are given. One of them is a generalization of

Card 1/2

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S/056/60/039/003/032/045 B006/B063

AUTHORS:

Lifshits, Ye. M., Khalatnikov, I. M.

TITLE:

Singularities of the Cosmological Solutions of Gravitatio-

[4] 公民主题的联络中央经济区域的政策的主题的主题的主题,且是他的主题的主题的主题。EPS的主义,"不是在100元代之,"(100元代表),在100元代表的主题的主题的主题的主题的主题的主题的主题的主题的主题的主题的主题

nal Equations AII

PERIODICAL:

Zhurnal eksperimental noy i teoreticheskoy fiziki, 1960,

Vol. 39, No. 3(9), pp. 800-808

TEXT: The sub-classes of cosmological solutions of gravitational equations derived in Ref. 1 (Part I of the present paper) usually have singularities. The question as to whether the existence of singularities is a general property of cosmological solutions, irrespective of the assumptions made for the distribution of matter and the field of gravity, has not been solved as yet. The solution of this problem is related to the existence or non-existence of a general solution of gravitational equations. Thus, the authors were confronted with the following problem: Within the region of a singularity that is assumed to exist, the form of the broadest class of solutions to gravitational equations is to be found, and conclusions are to be drawn as to the universal character of

Card 1/2

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AUTHORS: Bekarevich, I. L., Khalatnikov, I. M.

TITLE: Theory of the Kapitsa Thermal Discontinuity on the Interface Between Liquid He³ and a Solid

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 6(12), pp. 1699 - 1712

TEXT: Heat transfer between liquid He II and the surrounding solid is accompanied by a temperature jump which is related to the complicated temperature exchange between He II and the phonons of the solid. A

similar effect is displayed by He³ where the surface of the solid performs small vibrations, and the moved liquid carries away a small amount of energy. Nonetheless, a temperature jump occurs on the boundary. A theoretical description of this effect is presented here. The authors used

liquid He³ which was in contact with the vibrating surface of a solid. At low temperatures, liquid He³ can be regarded as a Fermi fluid, and its condition is characterized by an excitation distribution function which

Card 1/3

Theory of the Kapitsa Thermal Discontinuity on the Interface Between Liquid He³ and a Solid

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satisfies the equation of motion $\frac{\partial n}{\partial t} + \frac{\partial n}{\partial r} \frac{\partial \varepsilon}{\partial p} - \frac{\partial n}{\partial p} \frac{\partial \varepsilon}{\partial r} = I(n)$ (n - distribution function; ε - excitation energy which is a function of n; I(n) - collision integral; p - momentum). It may be assumed that all points of the body surface oscillate in phase. Therefore, the distribution function is only a function of the normal to the surface z. n is set equal to $n_0 + n_1$, where n_0 is the equilibrium Fermi function at absolute zero; thus, $\varepsilon = \varepsilon_0 + \int f(p,p^*) n_1(p^*) dp^*$ and $f(p,p^*) = \delta \varepsilon(p)/\delta n(p^*)$. Spherical coordinates, θ and χ , are introduced (θ is the angle between p and z; γ is the azimuthal angle), μ is substituted for $\cos \theta$, and the z-coordinates are measured in units of the mean free path $(1 = v_0 \tau)$; with $\omega \tau \to \infty$ (ω - oscillation frequency) one obtains equation (θ): $\mu \frac{\partial \phi}{\partial z} + (1 - i\omega \tau) \phi = -\frac{i\omega \tau F_0}{1 + F_0} \phi_0 - \frac{3i\omega \tau F_1}{1 + F_1} \mu \phi_{1n} - \frac{3i\omega \tau F_1}{1 + F_1} \circ \sqrt{1 - \mu^2} \cos \chi \phi_{1t}$. Next, the suitable boundary conditions are determined. When substituting $\psi(\mu)$, for $\phi(z,\mu)$ at z=0, one obtains equation (15): $\psi = -p_0 u_z (\mu + \xi) - p_0 u_t \cdot M - \mu^2 \cos \chi$, Card 2/3

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Theory of the Kapitsa Thermal Discontinuity
on the Interface Between Liquid He³ and a
Solid

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and the condition for freads $\psi_{1n} = \frac{1}{2} \int_{-1}^{1} \mu \psi(\mu) d\mu = -p_0 u_z/3$. The solution to (8) is divided into two parts (proportional to u_z and u_t) according to the two terms of (15). The solution corresponding to perpendicular surface oscillations is called the longitudinal solution, while that corresponding to tangential surface oscillations is called the transverse solution. The two types of solutions are discussed, and several relations are derived for diffuse reflection in both cases. Thereupon, mirror reflection is studied, in which case a solution is obtained through a Fourier expansion. Finally, several formulas are presented for the thermal resistance of the boundary, which is proportional to T^{-1} . Academician L. D. Landau is thanked for discussions. V. A. Fok is mentioned. There are 1 figure and 5 references: 4 Soviet and 1 US.

ASSOCIATION: Institut fizicheskikh problem Akademii nauk SSSR (Institute of Physical Problems, Academy of Sciences USSR)

SUBMITTED: June 13, 1960

Card 3/3

BEKAREVICH, I.L.; KHALATNIKOV, I.M.

Phenomenological deduction of the equations of vortex motion for He II. Zhur.eksp.i teor.fiz. 40 no.3:920-925 Mr '61. (MIRA 14:8)

1. Institut fizicheskikh problem Akademii nauk SSSR. (Vortex motion) (Helium)

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POKROVSKIY, V.L.; KHAIATNIKOV, I.M.

Superbarrier reflection of high-energy particles. Zhur. eksp. i teor. fiz. 40 no.6:1713-1719 Je '61. (MIRA 14:8)

 Institut fizicheskikh problem AN SSSR. (Particles (Nuclear physics))

3,1900(1538,1057)

25204 S/056/61/040/006/025/031 B108/B209

AUTHORS:

Lifshits, Ye. M., Sudakov, V. V., Khalatnikov, I. M.

TITLE:

Singularities of cosmological solutions of gravitation

equations. III

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40,

no. 6, 1961, 1847-1855

TEXT: In earlier papers (Refs. 1,2: ZhETF, 39, 149, 1960; ZhETF, 39, 800, 1960), Ye. M. Lifshits and I. M. Khalatnikov studied the form of the cosmological solution of gravitation equations near a point with time singularity. The general solution of gravitation equations with a fictitious singularity may be represented (by a proper choice of a synchronous reference system) in a form in which the singularity is synchronous for the entire space. Such a solution must contain eight arbitrary solutions of the three spatial coordinates: 1) four "physically different" functions, necessary to establish the gravitational field at a certain initial moment, 2) one function determining the initial hyper-

Card 1/3

25204 S/056/61/040/006/025/031 B108/B209

Singularities of cosmological ...

surface in the geometrical structure, 3) three functions related to the requirement that the conditions $g_{00} = -1$, $g_{00} = 0$ (1) for the metric

tensor (Refs. 1,2) permit any transformation of the spatial coordinates without involving time. The arbitrary choice of the spatial coordinates may be used to bring the first terms of the expansion for the metrics near the singularity into a form in which the spatial differential length is given by the formula

 $dl^{2} = g_{\alpha\beta}dx^{\alpha}dx^{\beta} = a_{ab}dx^{a}dx^{b} + (t - 9)^{2}a_{33}dx_{3}^{2} + 2(t - 9)^{2}a_{a3}dx^{a}dx^{3} (5),$

where the indices a,b assume the values 1,2; the quantities a_{ab} , a_{3a} , a_{33} , ϕ are functions of all three coordinates. These statements, together with the results of Refs. 1 and 2 lead to the conclusion that the presence of a time singularity is not a necessary property of cosmological models in the general relativity theory, and that the general case of arbitrary distribution of matter and gravitational field does not lead to such a singularity. The authors thank Academician D. L. Landau and

Card 2/3

25204 \$/056/61/040/006/025/031 B108/B209

Singularities of cosmological...

L. P. Pitayevskiy for discussions. There are 3 Soviet-bloc references.

ASSOCIATION: Institut fizicheskikh problem Akademii nauk SSSR (Institute

of Physical Problems of the Academy of Sciences USSR)

SUBMITTED: January 25, 1961

Card 3/3

S/030/62/000/002/007/008 B101/B110

AUTHOR: Khalatnikov, I. M., Doctor of Physics and Mathematics

TITLE: New studies in the field of low-temperature physics

PERIODICAL: Akademiya nauk SSSR. Vestnik, no. 2, 1962, 111 - 112

TEXT: This is a report on the VIII Congress on Low-temperature Physics held in Kiyev on October 13-20, 1961, by the Nauchnyy sovet po fizike nizkikh temperatur Otdeleniya fiziko-matematicheskikh nauk Akademii nauk SSSR (Scientific Council of Low-temperature Physics of the Department of Physics and Mathematics of the Academy of Sciences USSR). This Scientific Council has been working for eight years. The conference was attended by scientists of Moscow, Leningrad, Khar'kov, Kiyev, Sverdlovsk, Tbilisi, and other places. The following papers and results are mentioned: Tunnel passages of electrons through a dielectric lying between superconducting metal (Al, In, Sn, Pb) at 0.1 K. Superconducting modification of Bi, the superconductivity of Bi II being discovered with a transition temperature of 3.92 K at 25,000 kg/cm². Effect of electron scattering due to spin-orbit interaction on Night's shift in superconductors. Experimental investigation Card 1/3

S/030/62/000/002/007/008 B101/B110

New studies in the field of ...

of superfluidity of demixed phases of He3-He4 solutions. Investigation of the scattering of gamma quanta and slow neutrons in Fermi fluid (He⁵) to find the zero sound predicted by L. D. Landau. Piezomagnetic effect in siderite monocrystals, antiferromagnetic resonance in MnCO, and CoCO,. properties of Ni3Mn alloy between room temperature and 1.30K were studied to prove the coexistence of ferromagnetism and antiferromagnetism below 20.4°K. Measurements of the magnetic heat capacity of carbonates of transition metals between 80 and 1.5°K showed that the magnetic heat capacity (spin waves) in $MnCO_{3}$ exceeded that of the lattice by one order of magnitude. No spin waves were observed in FeCO3. Theoretical study of quantum oscillations of complex electroconductivity in perpendicular magnetic and electric fields, and of the de Haas - van Alphen effect for electrons in the metal. Theoretical prediction of a new type of oscillation of the ultrasonic absorption coefficient of metals in a magnetic field, which had already been proved experimentally in Zn monocrystals. Development of the theory of cyclotron resonance in metals. Experiments concerning the galvanomagnetic properties of Pb showed that the Fermi Card 2/3

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New studies in the field of ...

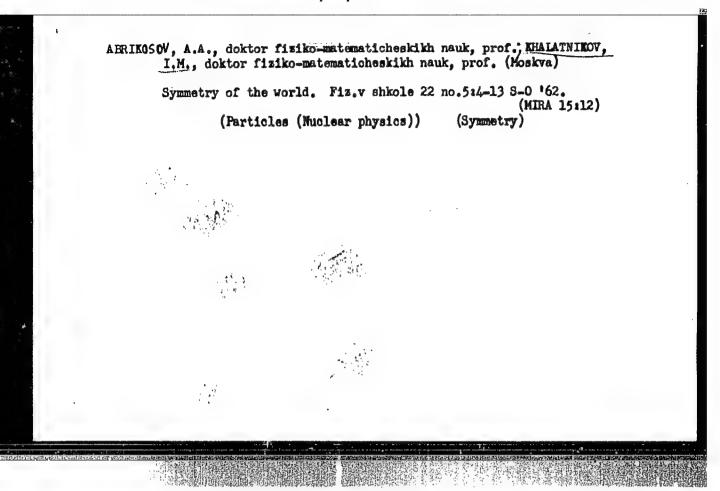
level in Pb consisted of two equal parts with opposite signs. Thermomagnetic and galvanomagnetic effects in InAs, InSb, and galvanomagnetic effects in Al and In at low temperatures were investigated. Anisotropy of the effective masses in Al was found by cyclotron resonance, and the Fermi velocities and the effective electron masses in Sn were measured. Analysis of the dimension effect of the electric resistance in metals to ascertain the free path of electrons. Prediction for semiconductors of a new resonance type on band carriers caused by the electric vector of a high-frequency field at low temperatures. Spectroscopic study of the resonance effect in wurtzite-type semiconductors at helium temperature led to the determination of the tensor of the effective masses. Hall effect and magnetic resistance of Ge in strong magnetic fields at low temperatures. Determination of the spin-spin and spin-lattice relaxation times in metal by "spin echo". Nuclear magnetic resonance in Tl with natural and enriched isotope content. Moessbauer effect of 23.8 kev gamma quanta on Sn 119 nuclei. Further reports dealt with low-temperature research, structure of strength, and polymorphous conversions at low temperatures.

Card 3/3

ABRIKOSOV, A.A., doktor fiziko-matematicheskikh nauk; KHALATNIKOV, I.M., doktor fiziko-matematicheskikh nauk, prof. (Moskva)

Academician Lev Davidovich Landau. Fiz.v shkole 22 no.1:21-27 Ja-F 162. (MIRA 15:3)

(Landau, Lev Davidovich, 1908-)



TAMM, I.Ye., akademik; ABRIKOSOV, A.A., doktor fiz.-matem.nauk; KHALATNIKOV, I.M., doktor fiz.-matem.nauk

Nobel prize winner for 1962. West.AN SSSR 32 no.12:63-67 D 162. (MIRA 15:12)

(Landau, Lev Davidovich, 1908-)

s/056/62/043/003/059/063 B104/B102

AUTHORS:

Patashinskiy, A. Z., Pokrovskiy, V. L., Khalatnikov, I. M.

TITLE:

Regge poles in nonrelativistic quantum mechanics

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43,

no. 3(9), 1962, 1117-1119

TEXT: A method of examining the position of the poles in the complex momentum plane for a large class of potentials was worked out. This method is closely related to that previously established by V. L. Pokrovskiy and I. E. Khalatnikov (ZhETF, 40, 1715, 1961). The nonanalytical potential U = U < 0 for r < a and U = 0 for r > a is studied on the basis of a semiclassical approximation to Schrödinger's radial equation. From the

 $x_1 J_{\nu}'(x_1)/J_{\nu}(x_1) = x H_{\nu}^{(1)'}(x)/H_{\nu}^{(1)}(x), \quad x^2/a^2 = 2mE,$

 $x_1^2/a^2 = 2m (E - U_0).$ (3)

Card 1/3

equations

Rege poles in nonrelativistic ...

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it is concluded that three series of poles exist. The first series is to the left of $v = x_1$ (Fig. 1), the second in the upper semiplane above the point x asymptotically approaching the line $\operatorname{Im} V = -1$ at $V_0 < E < 0$. The third series is missing when $V_0 < E < 0$, but approximately symmetric with the second series when E > 0. An analytical potential V(r) having singularities in the complex momentum plane is examined. When $E \gg U_0$ the poles are near to those values of V at which the level line has two points of inversion, $V_1 \approx V/k$ and $V_2 = V/k$. There are two series of poles in the upper semiplane. The first series extends to the left and downward of the point $V_1 = kr_0$, $V_2 = 2mE$, approaching the real axis asymptotically. The second series is situated right and left of the point $V_1 = kr_0$ where the asymptotes $V_1 = V_1 =$

Card 2/3

Card 3/3

Fig. 1

Fig. 2

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<u>_CIA-RDP86-00513R000721710013-9</u>

KEIDYSH, M.V., akademik; FFDOROV, Ye.k., akademik; ARTEIMOVICH, L.A., akademik; LANDAU, L.J.; LIFSHITS, Ye.M.; SHAL'NIKOV, A.I.; HEALATHIKOV, I.M.; ALET SEYEVS Y, N.Ye.; VAYNSETEYN, L.A.; PALLADIN, A.V., akademik; SATPAYEN, r.I., akademik; AMBARTSUMYAN, V.A., akademik; LUPREVICH, V.F.; MUSIFELISHVILI, N.I., akademik; KARAFEYEV, K.K.; MUSTEL', E.R.; MASEVICE, M.G., doktor fiz.-matem.nauk; EFRON, K.M.; MARTYNOV, D.Ya., prof.; GalGOR'YEV, A.A., alademik; MARIOV, K.K., prof.; COLOVAOVA, A.G., prof.; FILATOVA, L.G., prof.; FEYVE, Ya.V.; SEMIKHATOV, B.N., prof.; TITOV, A.G.; RYCHAGOV, G.I.; BARSKAYA, V.F.; VLASOVA, A.A.; BARAHOVA, Ye.P.; KIBARDINA, L.A.; ISACPENKO, A.F.; IL'INA, Yu.P.; DANILOV, A.I., prof.; PLAUDE, K.K.; NECHAYEVA, T.N., prof.; CHEPEK, L., doktdr; SZANTO, Ladislav, akademik; BELACHIK, Yozef; FAN KLOK V'YEN; ETGEHSON, M.S., prof. (L'vov); STARKOV, N.; ALRAMOVICH, Yu.; VOSKRESHISKIY, V.; KROPACHEV, A.; REZVOY, D., prof., (L'vov); KONDRAT YEV, V.M., akademik; LEBEDINSKIY, V.I., kand.geol.-mineral.nauk YANSHIN, A.L., akademik

"Priroda" is 50 years old. Priroda 51 no.1:3-16 Ja '62. (MIRA 15:1)

1. Prezident AN SSSR (for Keldysh). 2. Glavnyy uchenyy sekretar*
Prezidiuma AN SSSR (for Fedorov). 3. Akademik-sekretar* Otdeleniya
fiziko-matem.nauk AN SSSR (for Artsimovich). 4. Akademik-sekretar*
Otdeleniya biologicheskikh nauk AN SSSR (for Sisakyan). 5. Chlenkorrespondent AN SSSR, zamestitel* akademika-sekretarya Otdeleniya
(Continued on next card)

S/056/63/044/002/061/065 B188/B102

* ROHTUA

Khalatnikov, I. M.

TITLE:

Sound absorption in liquid He II below 0.6°K

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44, no.2, 1963, 769 - 771

TEXT: Both T. Woodruff (Phys. Rev., 127, 682, 1962) and K. Dransfeld (Phys. Rev. 127, 17, 1962) have assumed that sound absorption in He II occurs via three phonon processes. These processes are, however, forbidden at such low temperatures - not only because of energy and momentum conservation but also since the phononspectrum is stable against phonon decay. Therefore the author ascribes sound absorption to four-phonon processes (cf. ZhETF, 19, 637, 709, 1949). As a consequence, the absorption coefficient is obtained

as $\times = \frac{1}{7c} = \frac{5(u+1)^4}{87^3(9c)^2 \sqrt{\frac{kT}{hc}}} \left(\frac{kT}{hc}\right)^6 \frac{\omega}{c}$, i.e. $\omega \sim T^6$, and not, as obtained by Wood-ruff and Dransfeld, $\sim T^4$. $u = (9c/4c)(c/c) \approx 3$, e is the He-II density, c the sonic velocity, τ the phonon lifetime, and γ is a constant determined

Card 1/2

S/056/63/044/002/061/065 B188/B102

Sound absorption in ...

from the phonon energy at small momenta p: $\epsilon(p) = cp(1+p^2)$. From the experimental $\kappa(T)$ curve obtained by Chase and Herlin (Phys. Rev. 97, 1447, 1953) it is obvious that below $\kappa = 0.3$ K the slope of the curve corresponds to the T^6 -law. Quantitative agreement with the above relation for κ is obtained when γ is assumed to be equal to $1.5 \cdot 10^{35}$ (g·cm/sec)⁻². Therefore $\kappa = 0.3$ C can be considered as an asymptotic law for $T \to 0$. Above $\kappa = 0.3$ K three-phonon processes will contribute to sound absorption. There are 2 figures.

ADSOCIATION: Institut fizicheskikh problem Akademii nauk SSSR (Institute

of Physical Problems of the Academy of Sciences USSR)

SUBMITTED: November 28, 1962

Card 2/2

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000721710013-9

EWT(1)/FCC(w)/BDS AFFTC/ASD L 13566-63

ACCESSION NR: AP3003138

8/0056/63/044/006/2058/2061

AUTHOR: Andreyev, A.; Khalatnikov, I.

TITIE: Sound in liquid helium II near absolute zero

Zhurnal eksper. i teor. fiziki, v. 44, no. 6, 1963, 2058-2061 SOURCE:

TOPIC TAGS: liquid helium, sound velocity, sound absorption, low temperature, three-phonon porcesses, four-phonon processes, temperature dependence, frequency dependence

ABSTRACT: Oscillations in helium-II are considered for the low-temperature regions in which collisions between excitations are insignificant. Sound vibrations in liquid He sup 3 at low temperatures were considered by L. D. Landau (ZhETF 32, 59, 1957), and this paper considers sound in He sup 4 close to zero temperature. It is shown that the velocity of sound increases in this case with temperature, in proportion to the quantity T sup 4 ln(const/T), where T is the temperature, while the absorption is proportional to T sup 6 and to the frequency of the sound. Orig. art. has: 1 figure and 18 formulas. ASSOCIATION: Institut fizicheskikh problem Akademii nauk SSSR (Institute of Physics Problems, Academy of Sciences SSSR) DATE ACQ: 23 Jul 63 NO REF SOV: 004 ENCL: 00 SUBMITTED: 17 Jan 63

SUB CODE: 00 Card 1/1

OTHER: 001

Spring And Company of the second second Tatashinskiy, A. Z., Pokrovskiy, V. I., Walathikov, I. M. T.E: Fegge poles in problems concerning a quasi-classical potential well SOURCE: Zhurnel eksper. i teor. fiziki, v. 44, no. 6, 1963, 2062-2078 TOPIC TAGS: Regge poles, rectangular spherical potential well, physical and unphysical poles, levels and resonances ABSTRACT: A method recently proposed by the authors for finding the poles of the scattering phase shift (Regge poles) for the quasi-classical potentials (ZhETF v. 43, 1117, 1962) is used to analyze the simplest problem of Regge poles for the case of rectangular spherically-symetric potential well. In this case the scattering phase-shift can be explicitly expressed in terms of Bessel functions. In looking for the Regge poles, the previously developed metrical is used to follow the properties of the phase shift along level lines. Two series of poles are found, "physical" and "unphysical." The character of the motion of the poles with variation of the energy is then clarified and finally some general relations are established between the number of levels and 1/2

order not to complicate the calculations, the results remain valid essentially for potentials that have singularities outside the point r=0. Original article has 5 figures and 97 formulas.

ASSOCIATION: Institut fizicheskikh problem Akademii nauk SSSR; Institut teplofiziki Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Physics problems, Acad. Sci. SSSR; Institute of Thermophysics, Siberian Department, Acad. Sci. SSSR)

SUBMITTED: 17Jan63

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DATE ACQ: 23Jul63

ENCL: 00

SUB CODE: 00

NO REF SOV: 005

OTHER: 005

5/5

PATASHINSKIY, A.Z.; POKROVSKIY, V.L.; KHALA (NIKOV, I.M.

Studying of an S-matrix in a complex space of angular momenta in the quasi-classical case. Zhur. eksp. i teor. fiz. 45 (MIRA 16:10) no.3:760-771 S 163.

1. Institut teplofiziki Sibirskogo otdeleniya AN SSSR, Institut radiofiziki i elektroniki Sibirskogo otdeleniya AN SSSR i Institut fizicheskikh problem AN SSSR.

(Matrices) (Quantum theory)

PATATINSKIY, A.Z.; POKROVSKIY, V.L.; KHALATNIKOV, I.M.

Quasi-classical scattering in a centrally symmetric field. Zhur. eksp. 1 teor. fiz. 45 no.4:989-1002 0 '63. (MIRA 16:11)

1. Institut fizicheskikh problem AN SSSR.

LIFSHITS, Ye.M.; KHALATNIKOV, I.M.

Problems in relativistic cosmology. Usp. fiz. nauk 80 no.3: 391-438 Jl '63. (MIRA 16:9) (Cosmology) (Relativity (Physics))

KHALATNIKOV, I. M.

"Theory of fermi liquids and possibilities of $^{3}\mathrm{He}$ "

report submitted for 9th Intl Conf on Low Temperature Physics, Columbus, Ohio, 31 Aug-4 Sep 64.

Inst for Physical Problems, AS USSR, Moscow.

ACCESSION NR: AP4037581

\$/0056/64/046/005/1677/1679

AUTHOR: Kemoklidze, M. P.; Khalatnikov, I. M.

TITLE: Hydrodynamics of rotating helium II in an annular channel

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 5, 1964, 1677-1679

TOPIC TAGS: helium II, rotating helium II, annular channel, Feynman vortex, irrotational region, Feynman vortex region

ABSTRACT: Following the original work by Bendt and Oliphant (Phys. Rev. Lett. v. 6, 213, 1961 and Phys. Rev. v. 127, 1441, 1962), a variational method is used to derive an equation for the general description of the velocity fields in rotating helium II with annular configuration. It is shown that the Feynman vortices have an uneven distribution in an annular channel, and the liquid helium breaks up into two regions, one inside, without Feynman vortices in which the superfluid liquid rotates in irrotational fashion with a circulation much larger than the circulation quantum h/m, and an outside regic , containing a uniform system of Feynman vortices and rotating like a rigid body. The radius of the boundary between the two regions

ACCESSION NR: AP4037581

is estimated. The shape of the meniscus is also investigated and is found to differ little from plane, approaching parabolic with increasing speed of rotation. "We are grateful to Yu. G. Mamaladze for a discussion of the results." Orig. art. has: 7 formulas.

ASSOCIATION: Institut fizicheskikh problem AN SSSR (Institute of Physics Problems,

SUBMITTED: 25Jul63

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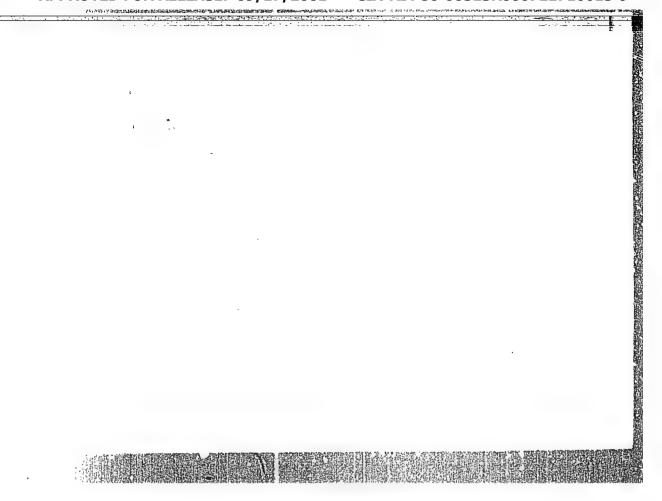
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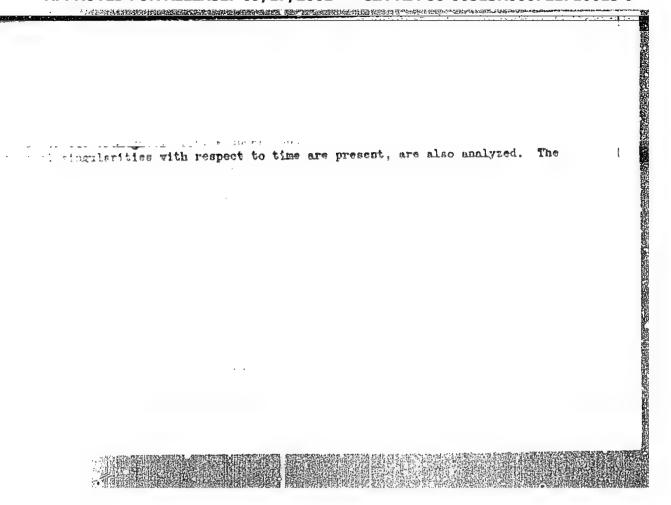
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Card 2/2

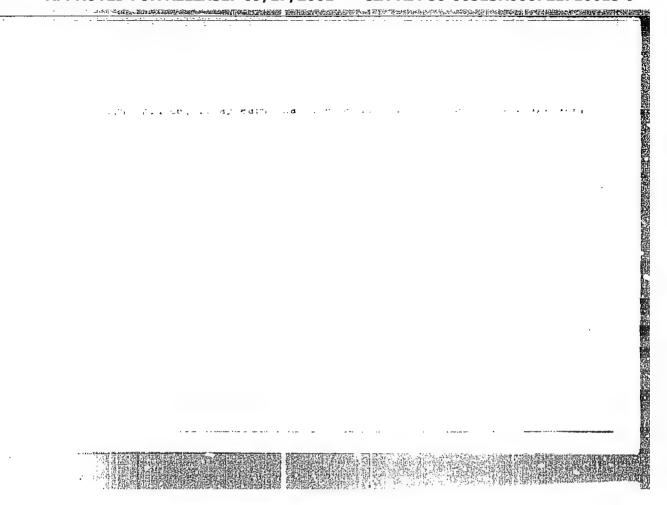
KHALATNIKOV, Isaak Markovich; KOZLOV, V.D., red.

[Introduction to superfluidity theory] Vvedenie v teoriiu sverkhtekuchesti. Moskva, Nauka, 1965. 157 p. (MIRA 18:9)





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SEE AL

KHALATNIKOV, Isaak Markovich, doktor fiz.-matem. nank, prof.; FAYNBOYM, I.B., red.

THE BOOK OF THE STREET STREET, AND THE STREET STREET, STREET, STREET, STREET, STREET, STREET, STREET, STREET,

[Quantum liquids] Kvantovye zhidkosti. Moskva, Izd-vo "Znanie," 1965. 15 p. (Novoe v zhizni, nauke, tekhnike. IX Seriia: Fizika, matematika, astronomiia, no.4) (MIRA 18:3)

EWT(1)/EWT(m)/EPF(n)-2/EWP(t)/EWP(b)/ETC(m) IJP(c) ACC NR: AP6002663 SOURCE CODE: UR/0386/65/002/012/0566/0572

AUTHOR: Khalatnikov, I. M.; Chernikova, D. M.

ORG: Institute of Theoretical Physics, Academy of Sciences SSSR (Institute theoreticheskoy fiziki Akademii nauk SSSR)

TITLE: Dispersion of sound in superfluid helium

SOURCE: Zhurnal eksperimental noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu.

TOPIC TAGS: helium, superfluidity, sound propagation, cryogenics

ABSTRACT: After showing that it is possible to separate from the system of equations describing the propagation of sound oscillations in helium II, and described by them earlier (ZhETF v. 49, No. 12, 1957, 1965 and v. 50, No. 2, 1966, in press), two pairs of equations describing propagation of first and second sound respectively, they proceed to compare their earlier results with the latest measurements of the absorption coeffecient of second sound by W. A. Jeffers and W. M. Whitney (Phys. Rev. v. 139, 1082, 1965) and C. E. Chase (Ph.D. Thesis, Cambridge University, 1954, unpublished). They show that the temperature dependences of the firstsound absorption coefficient calculated with their formulas for 1, 2.02, 5.91, and

Card 1/2

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L 12176-66 EWT(d) IJP(c)
ACC NR. AP5024722 SOURCE CODE: UR/0056/65/049/003/1000/1008
AUTHORS: Belinskiy, V. A.; Khalatnikov, I. M.
ORG: Institute of Physics Problems, Academy of Sciences SSSR (Institut fizicheskikh problem Akademii nauk SSSR)
TITLE: General solution of the gravitational equations with a simultaneous fictitious singularity
SOURCE: Zhurnal eksperimental noy i teoreticheskoy fiziki, v. 49, nc. 3, 1965, 1000-1008
TOPIC TAGS: cosmology, gravitation field, singular integral
ABSTRACT: A general solution of the gravitational equations in vacuum is derived in a synchronous coordinate system, which possesses a
simultaneous fictitious singularity reached by all points in space at the same time t = 0. The vacuum gravitational equations solved are
those of E. M. Lifshits and I. M. Khalatnikov (UFN v. 80, 391, 1965 and
earlier), but in the present pa or the solution is constructed analytically in a manner in which transformations containing two-dimensional
or three-dimensional functions are eliminated. The only arbitrariness left i the metric of the solution is physical. It is shown further
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Card 1/2

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KHALATNIKOV, I.M.; CHERNIKOVA, D.M.

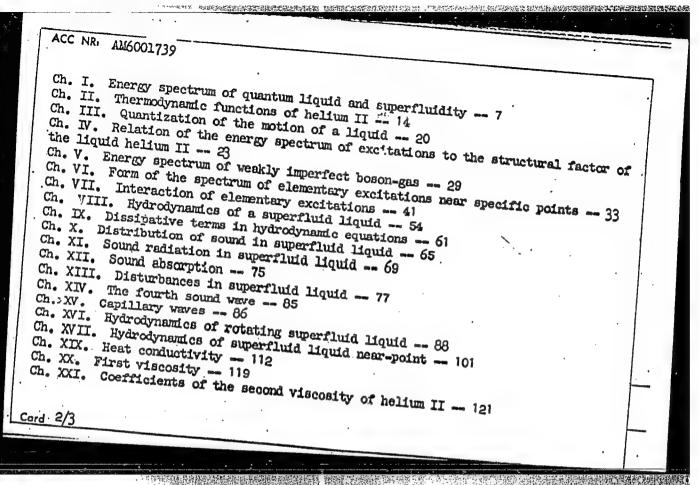
Sound dispersion in superfluid helium. Pis'. v red. Zhur. eksper.

i teoret. fiz. 2 no.12:566-572 D'65. (MIRA 19:1)

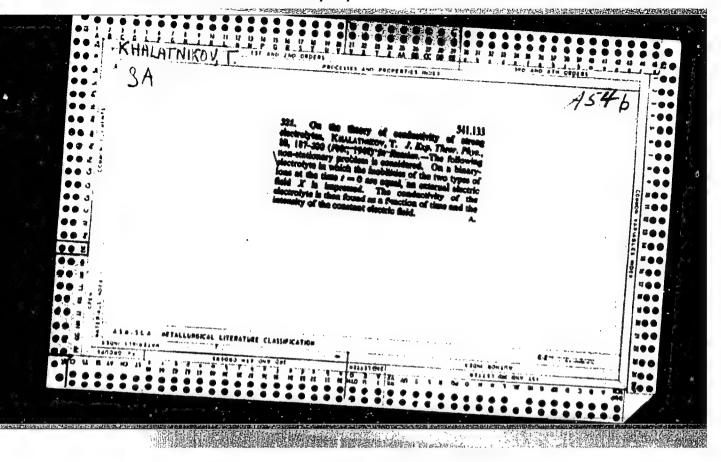
1. Institut teoreticheskoy fiziki AN SSSR. Submitted Nov. 9, 1965.

L 25706-66 EWT(1)/EWT(m)/EEC(k)-2/EPF(n)-2/I/EWP(k)/ETC(m)-6 ACC NRI AP6002742 (JP(c) SOURCE CODE: UR/0056/65/049/006/1957/1972 AUTHOR: Khalatnikov, I. M.; Chernikova, D. M. ORG: Institute of Theoretical Physics, Academy of Sciences SSSR (Institut teoreti- B TITLE: Relaxation phenomena in superfluid helium SOURCE: Zhurnal eksperimental noy i teoreticheskoy fiziki, v. 49, no. 6, 1965, TOPIC TAGS: liquid helium, superfluidity, phonon interaction, phonon scattering, kinetic equation, acoustic propagation, relaxation process ABSTRACT: Since the propagation of sound in a superfluid cannot be considered in the hydrodynamic approximation at high frequencies and the kinetic equation must be used, the authors solve the problem by analyzing the various interactions between the different excitations (phonons and rotons) in the superfluid. The cross sections for the scattering of phonons by phonons by rotons, and rotons by rotons are determined and the corresponding kinetic equations analyzed. It is shown that the longest relaxation time is possessed by the interaction between the phonon and roton gases. A bystem of equations, valid for both high and low frequencies, is derived, describing the propagation of sound oscillations with allowance for the relaxation processes. Orig. art. has: 1 figure and 45 formulas. SUB CODE: 20/ SUBM DATE: 26Jul65/ ORIG REF: 012/ OTH REF: 014 UDC: 530.14

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KHALATOV, I.Ye.

Merited glory of work. Elek.i tepl.tiagn 5 no.9:26 S '61.

(Locomotive engineers)

(MIRA 14:10)

Stanki i instrument, no. 10, 1962, p. 44

Dissertations

S/121/62/000/010/005/005

The following dissertations for the degree of Cand. of Technical Sci. were presented:

A.A. Khalatyan, at the Kiyov "Order of Lenin" Polytechnic Institute, "On the at the Odesskiy politekhnicheskiy institut (Odessa Polytechnic Institute), "Investigation of Error Sources in the Method of Measuring Torque by Means of a Tensometric Clutch".

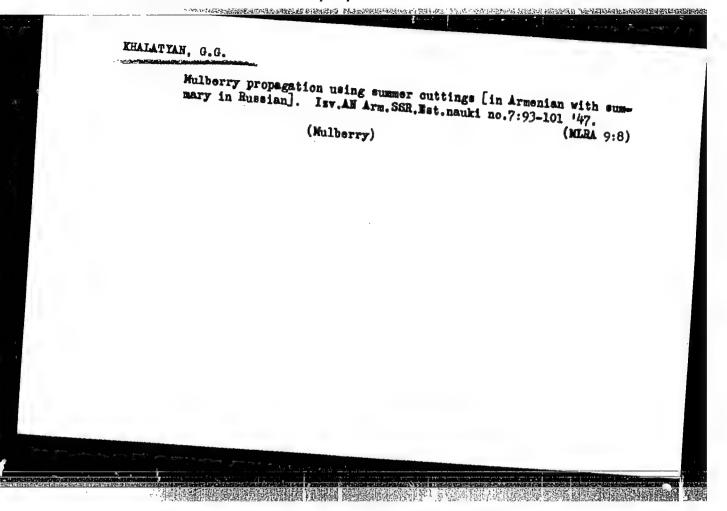
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KHALATYAN, E.S.

Distribution of boron in the rocks and underground waters of the Erivan region. Izv. AN Arm. SSR. Nauki o zem. 18 no.1:31-39 165.

1. Institut geologicheskikh nauk AN Armyanskoy SSR.

(MIRA 18:5)



APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000721710013-9"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000721710013-9 KHALATYAN, G.G. Mulberry trees in mountainous regions of the Armenian S.S.R. Biul.Bot.sada [Eriv.] no.11:65-78 '51. (Armenia--Kulberry) (MLRA 9:8)

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000721710013-9"

THALATYAN, G.G.

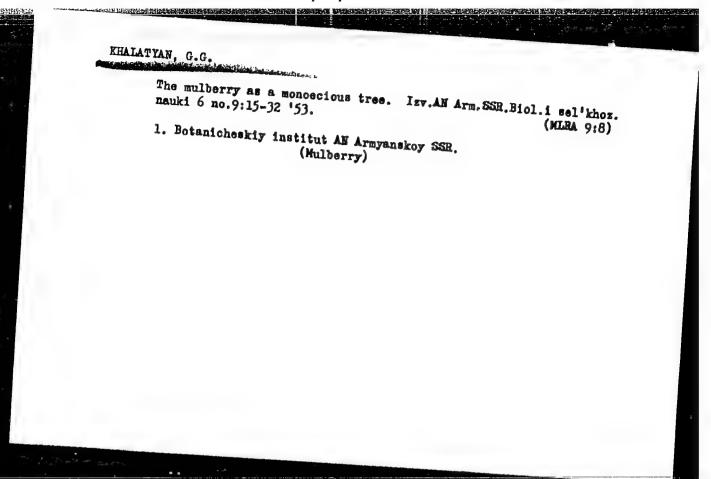
Results of planting mulberry trees in mountainous regions of the Armenian S.S.R. (preliminary report). Biul.Bot.sada [Eriv.] no.12: (MLRA 9:8)

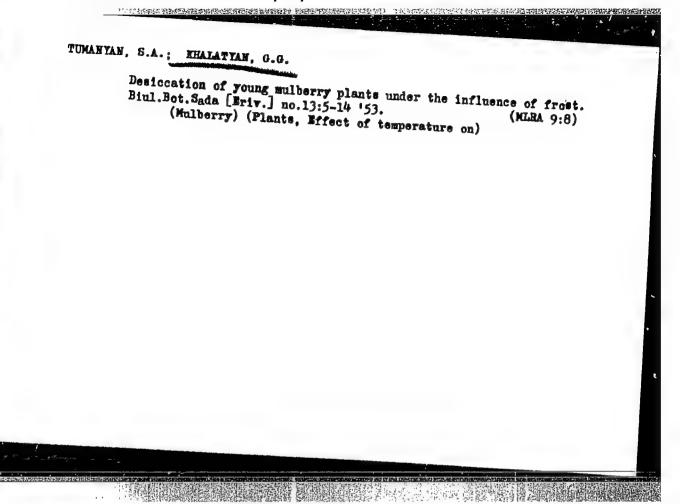
(Armenia--Mulberry)

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KHALATYAN, G.

6854. Khalatyan, G. Peredoviki tutovodstva na Vsesoyuzndy sel'skokhozyaystvennoy vystavke. Yerevan, 1954. 43 s. s. ill. khozyaystva Arm. SSR). 1.000 ekz. Bespl. z Na arm. yaz. - 638.2 st (47.925)

SO: Knizhnaya Letopis' No. 6, 1955

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000721710013-9"

An unusual staminate flower in the mulberry. Ixv.AN Arm.SSE, Biol. i sel'khoz.nauki 19 no.8:101-102 Ag '57. (MIRA 10:10)

1. Botanicheskiy institut Akademii nauk ArmSSE. (Mulberry) (Inflorescence)

Experiments on photoperiodism in the mulberry. Izv. AN Arm.SSR.

Biol. i sel'khoz.mauki 11 no.8:87-95 Ag '58. (MIRA 11:10)

1. Botanicheskiy institut AN Arm.SSR.

(Photoperiodism) (Mulberry)

KHALATYAN, G.G.

Tissues of various quality in mulberries. Izv. AN Arm. SSR. Biol. nauki 14 no.10:91-96 0'61. (MIRA 16:7)

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l. Nauchno-issledovatel skaya stantsiya shelkovodstva Armyanskogo nauchno-issledovatel skogo instituta semledeliya. (MULBERRY) (PIANT CELIS AND TISSUES)

KHALATYAN, O. I. and AFANAS'YEV, A. N.

Reported on the water balance of the Lake Baykal and the Khrami water reservoir.

report presented at the And All-Maton Mydrological Congress. 7-17 Oct 1957, Leningras

Tov Ak Nous Gont, nor geograf., 3, pp3-9, 1861

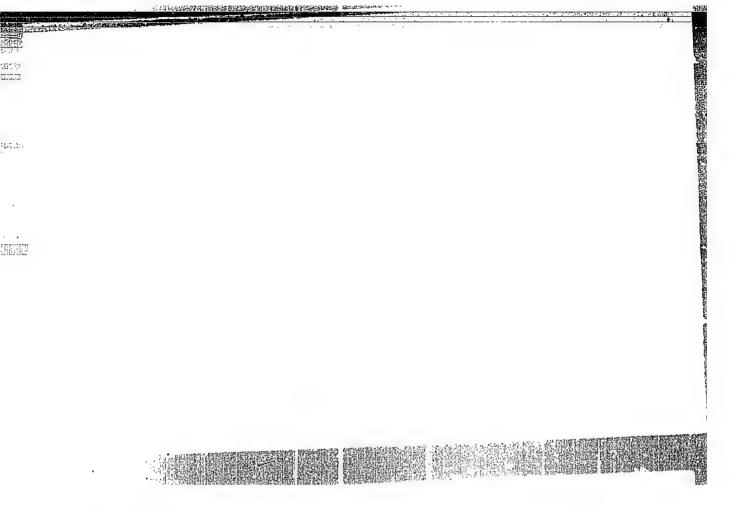
KHALATYAN, O. I. PA 15/49T53 USSR/Engineering Jun 48 Hydraulics Filtration . "Studying the Losses Due to Filtration at the Reservoir of the Khram' Hydroelectric Power Station," O. I. Khalatyan, Engr, 2 3/4 pp "Gidrotekh Stroi" No 6 Station put into service 31 Dec 1947. Feeds Georgia network. Describes method and plots results of study made to determine filtration losses. Calculated figures, prior to study, varied widely. 15/49153

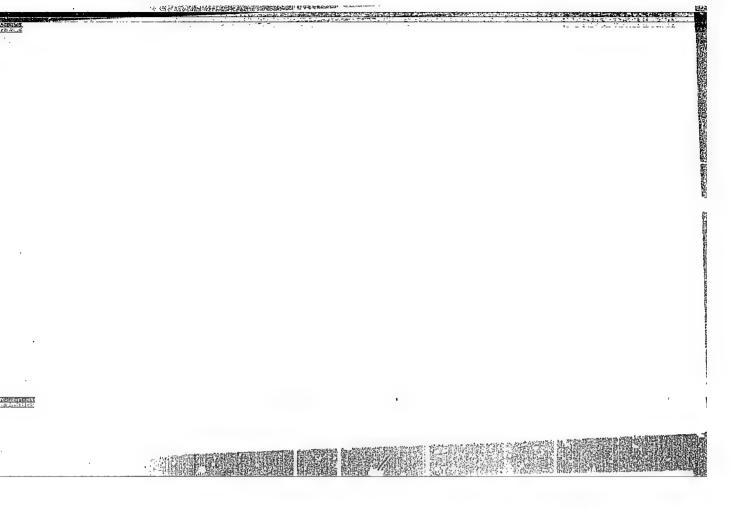
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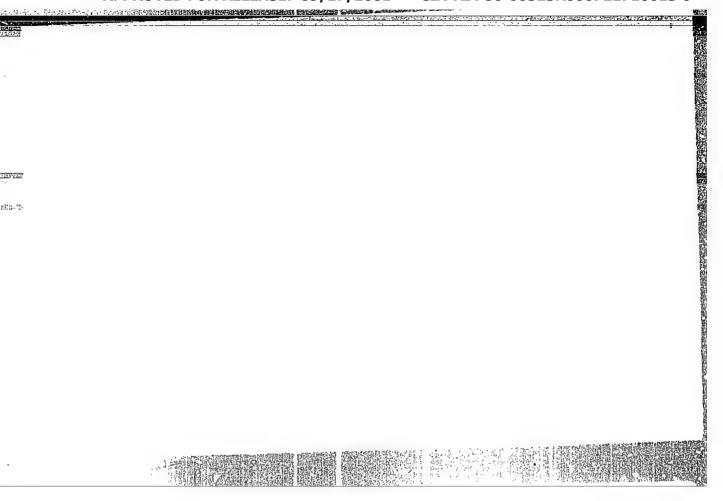
KHALAVITSKIY, Z. Z.-

"Unutilized Possibilities for Determining the Spatial Distribution of Gvercast," Meteor. i Gidrol., No.1, pp 32-33, 1955

Translation M-737, 29 Aug 55



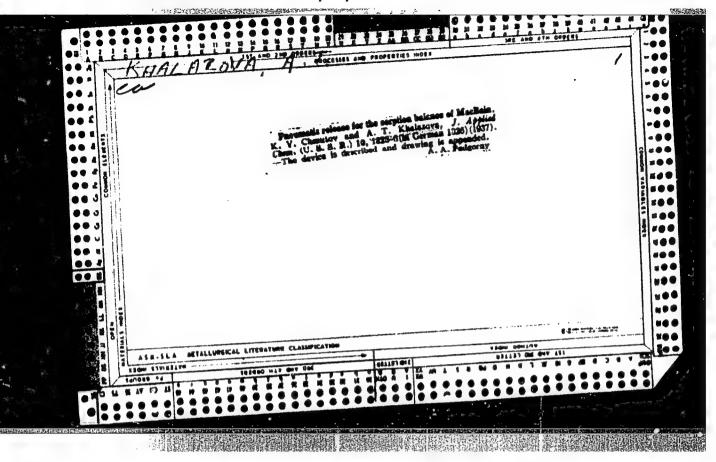


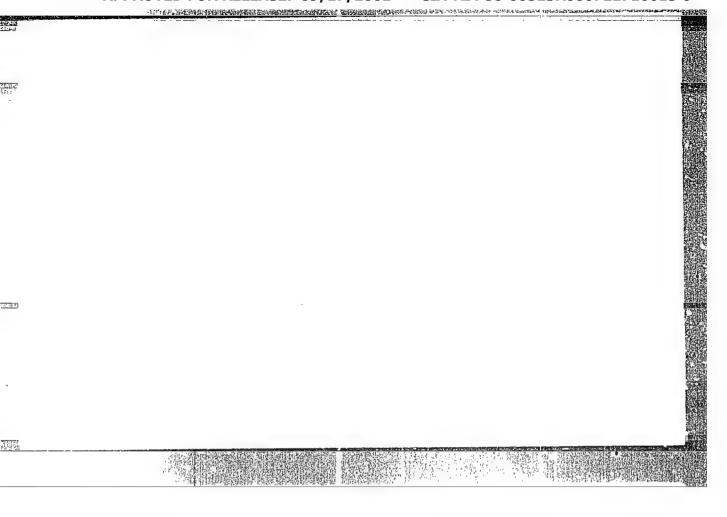


GOKHSHTEYN, D.P., doktor tekhn. nauk; DEKHTYAREV, V.L., kend. tekhn. nauk; OLESEVICH, Ye.K., inzh.; TISHCHENKO, B.S., inzh.; KHALAYDZHI, V.N., inzh.; RYABOVA, A.S., inzh.; BYKOV, V.N.; KOZOREZ, A.I., inzh.

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Carbon dioxide system with medium power output. Energomashinostroenie 10 no.11:20-22: N º64 (MIRA 18:2)

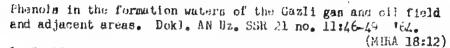




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i	A. I.; Bogdanov, O. S.; Bukayev, P. V.; Vakhrushin, Yu. P.; A. I.; Buslov, V. A.; Khal chitakiy, Ye. P. alivayko, G. A.; Pavlov, A. I.; Suslov, V. A.; Khal chitakiy, Ye. P.	
ORG: none		
TITLE: Linear ind	uction accelarator	
SOURCE: Atomnaya	energiya, v. 21, no. 6, 1966, 439-445	
TOPIC TAGS: lines	ar accelerator, electron accelerator, mew accelerator	
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was designed a (NIIEFA) in pulse current based on the system considerent of sufficient determined circuit of 1000 smp/pu	in is given of the LIU-3000 linear induction accelerator, which with Scientific-Research Institute for Electro-Physical Devices 2,962. The LIU-3000 was designed for an energy of 3 kev and a control of up to 200 amp. Its operation for electron acceleration is a utilization of a rotational electric field, created in a utilization of a rotational electric field, created in a citing of several circular transformers. The maximum possible it in accelerated electrons in such an accelerator with focusing the accelerated electrons in such an accelerator with focusing to compensate for the repelling force of the space charge, is believed by the power of the commuting element in the primary the inductor. The LIU-3000's power can be brought to the inductor. The LIU-3000's power can be coelerators. The	- -
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vacuum sealed connected in observation d were obtained maximum energe electrons, 48 pulse duratio front of accefield, 310 km In addition t designing and A. V. Belyayo D'yachenko, A. V. Popkov	ists of a series of a in 1963). Each section to permit a vacuum of pairs into units with a vices are situated from tests: maximum of injected electro the accelerating lorating voltage, 0.1 m; and diameter of the the authors, other ditesting the LTU-3000 at a, 0. D. Volodin, M. V. Toloknov, Tu. V. ich, A. N. Popov, S. d. A. T. Chesnokov.	the aid of special between the units. current of accelerates, 300 kev; energy se current pulse of t; voltage, 0.35 page; average grad the accelerated beam staff mumber of NIIE overe R. A. Alekseys. A. Gashev, V. K. G. Lebedov, A. A. Karl V. Promyshlyayev, G.	pipes. Purping The following da ed electrons, li of accelerated the gun, 2.2 µsed duration of the lient of acceler. (at the exit), EFA who participate, L. H. Andrez agon-Torn, H. K. khel', P. G. Hor L. Saksaganskiy	and ita 30 amp; c; c pulsa ating 2 cm. ated in an, reyov, r, Ya. L.	
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AVAZOV, T.N.; KREMMER, A.M.; KHALDAROV, S.



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1. Institut goologii i razrabotki neftyanykh i gazovykh mestorozhdeniy Gosudarstvennogo geologicheskogo komiteta SSSE. Submitted June 21, 1963.

Hydrostatic experiments. Fig. v shkole 14 no.4:63-65 Jl-Ag 154. (MLRA 7:7)					
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KHALDEY, L.M.

Instrument demonstrating the concept "Pressure". Fiz. v shkole 15 no.3:63-64 My-Je '55. (MLRA 8:6)

1. 45-ya shrednyaya shkola (g. Chkalov) (Pressure (Physics))

1 00734-66 EWT(m)/T/EWP(t)/EWP(b)/EWA(c) JD

ACCESSION NR: AP5022700

UR/0181/65/007/009/2655/2659

AUTHOR: Garber, R. I.; Soloshenko, I. I.; Khaldey, O. A.

TITLE: Relaxation of critical stresses of motion and critical stresses of multiplication of <u>dislocations</u> with repeated bending

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SOURCE: Fizika tverdogo tela, v. 7, no. 9, 1965, 2655-2659

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TOPIC TAGS: lithium fluoride, sodium chloride, plastic deformation, bend test, bending stress, stress relaxation 4

ABSTRACT: Critical stresses of multiplication and motion of dislocations are studied in lithium fluoride and sodium chloride specimens as functions of the number of loading cycles, the temperature and the loading method. It is found that there is a reduction in the critical stress with an increase in the number of cycles. For Lif, one-time loading is associated with a stress of 600, ten times loading with 250, and 100 times with 70 g·mm⁻². The corresponding values for NaCl are 300, 150 and 50 g·mm⁻². Mechanical strength increases with the number of cycles. This is shown by a gradual reduction in the number of regenerated dislocations and by a decrease in the damping constant of elastoplastic vibrations. Holding in the unloaded state at room temperature for 150 seconds after each loading cycle complete-

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ACCESSION NR: AP5022700

ly nullifies the effect of repeated bending. The effect is also cancelled by a frequency of 1 cps at a high temperature (300°C). It is assumed that the multiple loading effect is caused by separation of the dislocations from barriers. The energy of activation for effecting this separation is ~0.4 ev. The results show that the repeated action of small stresses can cause plastic deformations if the pauses are short enough to prevent reversal of the process. Orig. art. has: 10 figures, 1 table.

ASSOCIATION: Khar kovskiy gosudarstvennyy pedagogicheskiy institut im. G. S. Skovorody (Kharkov State Pedagogical Institute)

SUBMITTED: 09Mar65

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KHALDEY, S.

Creative people. Neftianik 7 no.12:18-19 D '62.

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1. Zaveduyushchiy otdelom Azerbaydzhanskogo Soveta professional:nykh soyuzov.

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ABDULLAYEV, A.A.; KOPYSITSKIY, T.I.; LEYTMAN, Yu.S.; MAMED-ZADE, A.G.; KHALDEY, Z.V.

Temperature-control system for a catalytic-cracking reactor with a finely divided catalyst. Nefteper. i neftekhim. no.8:19-22 163. (N RA 17:8)

l. Nauchno-issledovatel'skiy i proyektnyy institut po kompleksnoy avtomatizatsii proizvodstvennykh protsessov v neftyanoy i khimi-cheskoy promyshlennosti, g. Baku.

KYAZIMOV, A.A.; KHALDEY, Z.V.; KHAR'KOVSKIY, Yu.I.; YURIN, M.I.

THE STOREST OF THE SECOND SECO

Determination of the quality of raffinate at the output from an extraction column on oil selective purification units using furfural. Khim.i tekh.topl. i masel 10 no.1:24-26 Ja 165.

(MIRA 18:4)

1. Bakinskiy zavod im. XXII s"yezds Kommunisticheskoy partii

Sovetskogo Soyuza i Nauchno-issledcvatel'skiy i proyektnyy
institut po kompleksnoy avtomatizatsii proizvodstvennykh
protsessov v neftyanoy i khimicheskoy promyshlennosti.

KYAZIMOV, A.A.; KHALDEY, Z.V.; KHAR*KOVSKIY, Yu.I.

Colorimetric method for determining furfurole in the products and waste water of the selective purification of oils. Khim.i tekh. topl.i masel 8 no.11:61-64 N '63. (MIRA 16:12)

SHEVCHENKO, A. (UB5CLX) (Chernovtsy); BASOV, V. (Moskva); FRILUTSKIY, G. (Pyatigorsk); ARKHIPOV, Ye. (Bugul ma); VYSOCHIN, V. (Moskovskaya obl.); PRIKHUNOV, I. (Moskovskaya obl.); OBLASOV, G. (Kiyev); SMIRNOV, Yu. (UA4YB) (Kanash); KHOKHLOV, B. (Moskva); KHALDEYEV, A. (Przheval sk); SKOBELEV, I. (Primorskiy kray); PROSKUROV, V. (Irkutsk); DOBRYNIN, Yu. (g. Ivanovo /obl./)

Exchange of experience. Radio no.10:22,26,29,32,37,40,44,46,58 0 *64. (MIRA 18:2)

KHALDEVEV, T. M.

Dissertation: "Certain Methods of Solving Axonometric Problems." Cond Tech Sci, Morcow Order of Lenin Aviation Inst ineni Sergo Ordzhonikidze, 26 April. (Vechernyaya Moskva, Moscow, 16 April)

So: SUN 243, 19 Oct 1934

KHALDEYEV, M.I.

Timiriazev District in the capital. Gor.khoz.Mosk. 36 no.6:28-30 Je 162. (MIRA 15:8)

1. Pervyy sekretar Timiryazevskogo rayonnogo komiteta Kommunisticheskoy partii Sovetskogo Soyuza. (Moscow—City planning)

5(1,3,4) AUTHORS: SOV/153-2-1-22/25

Fasman, A. B., Khaldeyev, O. D., Sokol'skiy, D. V.

TITLE:

Generation of Tribbelectricity During the Catalytic Hydrogenation in Non-conductive Media (O vozniknovenii tribo-

elektrichestva pri kataliticheskoy gidrogenizatsii v

neprovodyashchikh sredakh)

PERIODICAL:

Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya

tekhnologiya, 1959, Vol 2, Nr 1, pp 123-125 (USSR)

ABSTRACT:

Static electricity with a potential of several kilovolts is produced by the friction of dielectric liquids at the container-or the tube walls of any shape (Refs 1-3). If conductive substances are added to hydrocarbon, the electric charge first increases and is then reduced and ceases completely at specific

resistances of below 10 ohms.cm. Since during the catalytic hydrogenation dielectric liquids (hydrocarbons, ether) are employed by intensely stirring the reaction mass, it was interesting to determine whether friction electricity is herein produced and how it affects the process of hydrogenation. Figure 1 shows an apparatus designed for measuring the electrification potential. Figure 2 gives the charge curves for n-heptane and

Card 1/3